Developing a web application to improve communication at a software company.

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EU	European Union (Abbreviation)

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Chapter 5: Artefact Design

1. Introduction

The goal of this study is to develop a web application that can be used to enhance communication between developers and management at a South African software development company. As discussed in Chapter 2, this study follows the Vijay Vaishnavi (2004) process model, this chapter will focus on the "Development" phase. This chapter is the end of the initial section of the process model and the beginning of production.

2. Problem description and background

In the corporate world, businesses rely on effective communication to succeed. Developers use their screens to communicate and to develop, it often happens that developers lack the number of screens that they need to keep all their important tabs open. This makes it harder for important messages to reach developers and influences productivity and creativity (Schrader, 2018).

As a solution, an artefact has to be developed to assist with the effectiveness of communication in the industry.

3. Aims and objectives of project

This study proposes the development of a communication web application that can easily be viewed in an office by all employees to allow easy access to important communication regarding specific software development projects. Where the primary objective is to develop a web application for a South African software development company that allows for easy access to important communication relating to specific project.

The focus of this chapter is the development phase of the Vijay Vaishnavi (2004) process model and give a visual explain on how each of the requirements or specification is implemented with the use of screenshots and explaining some of the features that was added and how to use them.

4. The Artefact Design

4.1. Summary of feedback

The design of the artefact has to satisfy the requirements as set out in Chapter 4, the suggestion phase. Along with the requirements and specifications, the artefact also followed the human-computer interaction rules to provide the best user experience as discussed in Chapter 3 of this study.

The conclusion was that the artefact should improve both communication and productivity in the company. To achieve this the artefact should not only focus on communication between employees, but also communicate the information about the project. The artefact should create a more relaxed environment in the company, while making it easier for the users to interact with the communication aspect that is required in the industry.

Table 4.1. below shows the requirements or specifications and how it will be solved with the use of the built artefact.

1. **Table 4.1: Most important requirements and specifications**

Most important requirements and specifications		
#	**Requirement or specification**	**How it is solved in the artefact**
1.	Improve communication.	By combining different methods of communication as discussed in Chapter 2 of this study. For the Artefact the communication methods that was focused on was instant messages and Issue queues. For this study a new "Chat" feature was developed, this is to satisfy the need for an instant messaging feature. There was also a new "Drag and drop" feature developed where users can add items to a "To Do" list and move the item to either "Doing" or

		"Done", this was added to satisfy the need for an Issue queues feature.
2.	Improved productivity.	For a project overview, a member of a team will be able to see an overview of their team under a feature named "My Team". The feature will also provide important information on their team such as employee numbers, member status, member name and surname, member email, what the member is busy with and when last they were online. This will satisfy the need for improving productivity as a team as they are always aware of what they whole team is busy with.
3.	Artefact should focus on communication between employees and communication about the project.	Not only can users communicate with each other, but they can also get the necessary information about their project. For this artefact, an "Activities" feature was added. The Activities feature provides information on the backlog of the project, this includes the name, category, importance, and the status of the activity. Each activity can be edited at any moment as well as a bulk action to either archive or delete the actions, this will also improve productivity as less time is spent on the actual artefact and more time on the project. An analytics page is also added to the artefact to give information on the overall project, this includes "Sales Stats", "Activity Timeline"

		and "Project Timeline". This will provide a more long-term plan for the project.
4.	Create a relaxed environment.	A new calendar feature was developed for the artefact. The calendar can be viewed as either "Monthly", "Weekly" or "Yearly". This creates a more flexible way of planning the project and everyone in the team can contribute to events. The team can also tag each event with "Business", "Work", "Personal" or "None". They can also add a "URL" to an event, this can include a "Zoom" meeting link, "YouTube" link or any important link needed for the event. This will improve the structure of the project and make members of the team more relaxed knowing that every event is planned out.
5.	The user experience comes first.	By using pre-emptive dialog, users will make minimal errors when working with the artefact. This includes the ten human-computer interaction rules discussed in Chapter 3. This includes having validation on each input of the user, having loading elements if the user has to wait for data to be retrieved as well as having the ability to change something that they saved incorrectly.

4.2. Artefact design

The design of the artefact is based on the most important requirements and specifications shown in Table 4.1. The next section of the study will visually explain how each of the requirements or specification was implemented with the use of screenshots and explaining some of the features that was added and how to use them.

4.2.1. Improve communication

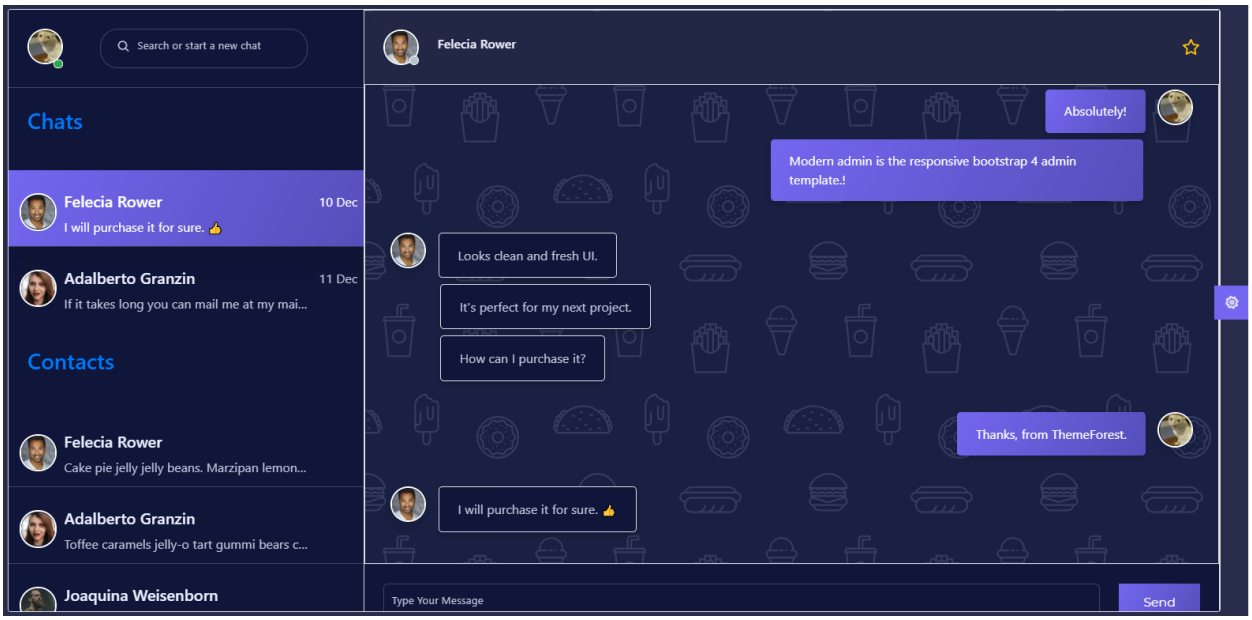

Figure 1: Instant messages

Figure 1 shows the chat feature that was added to the artefact, each member will be able to see their "Chats" on the left of their screens as well as all their team members. On the right side of their screens, they will be able to see their "Chat" as well as be able to send messages to other members of their teams. The "Chat" was added to support the need for an instant messenger feature where members of a team will be able to communicate with each other.

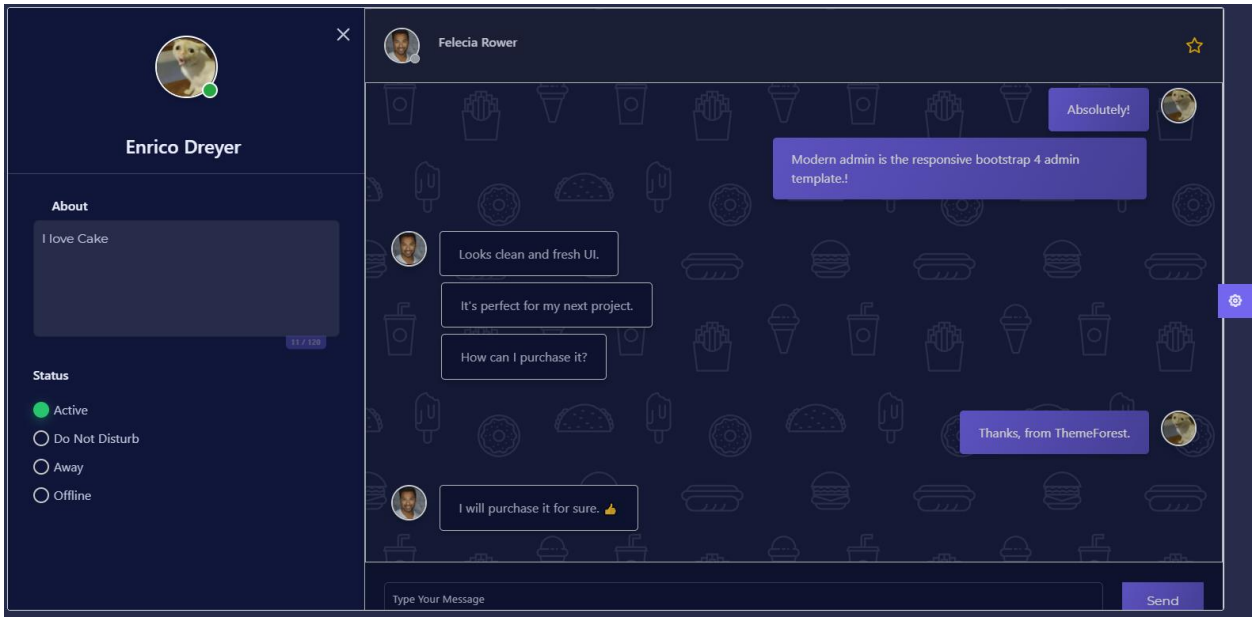

Figure 2: Instant messages Profile

When clicking on your own user profile, you will be able add an "about" that is linked to your profile as well as change your profile status to either "Active", "Do Not Disturb", "Away" or "Offline" as shown in figure 2.

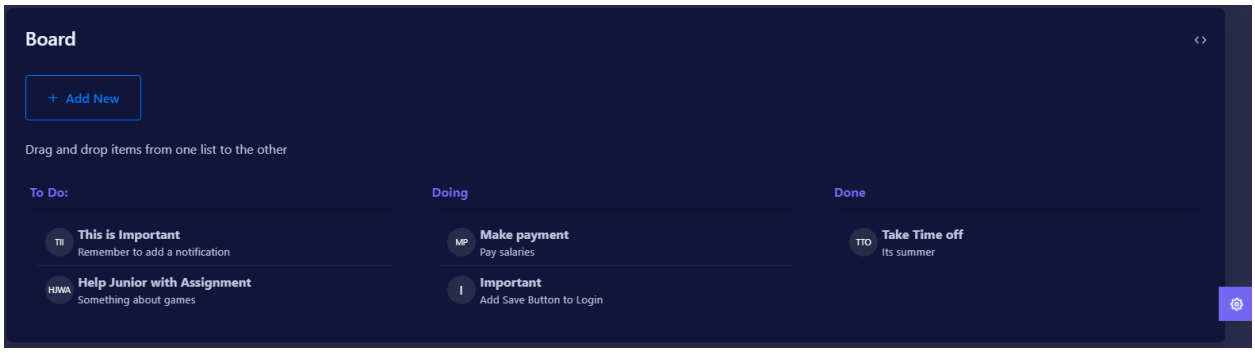

Figure 3: Issue queues

The artefact also focused on Issue queues as another way of communication. As shown in Figure 3, a user can add items to the "To Do" list by clicking on the "Add New" button that will prompt a popup asking them for the detail of the item that they want to add. The user can them move the items to one of the three lists ("To Do", "Doing", and "Done"). This feature improves the flow of activities being done in the project, as well as assist in organizing what needs to be done.

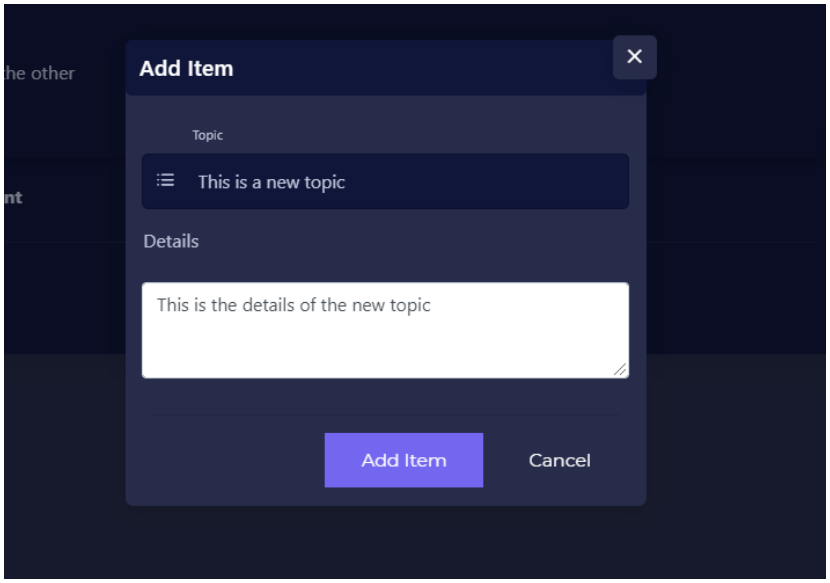

Figure 4: New issue queue pop-up

As shown in Figure 4, the user can add a new item to the drag and drop. The user is obligated to add a topic to the item, along with the details of the item that is added. When the item is added it will display in the "To Do" list.

4.2.2. Improve productivity

Figure 5: Team detail

Figure 5 displays information on the team and what they are busy with. This includes seeing the employee number, status, name and surname, email and when they were last online. As a team you work together to reach a common goal, by sharing the information on what each team member is busy with allows for easier sharing of the workload, thus reducing the pressure of each individual (Wehbe, 2017). This feature allows the user to get a broad overview on what is going on in the project. Having a team members email is beneficial for it allows them to have a different communication method if the team member is offline.

4.2.3. Focus on both communication between employees but also about project

Figure 6: Project Detail

Figure 6 shows the list of activities that can be added by a user. Each activity consists of a name, category, importance, and a status. Each activity can be either edited or deleted. A user can add a new activity by clicking the "Add New" button, this will prompt a separate component on the right side of the screen. The user can also select multiple activities and choose to either delete or archive the action. A user can also search their activities by using the search function on the top right, along with picking how many activities they want to see at a time.

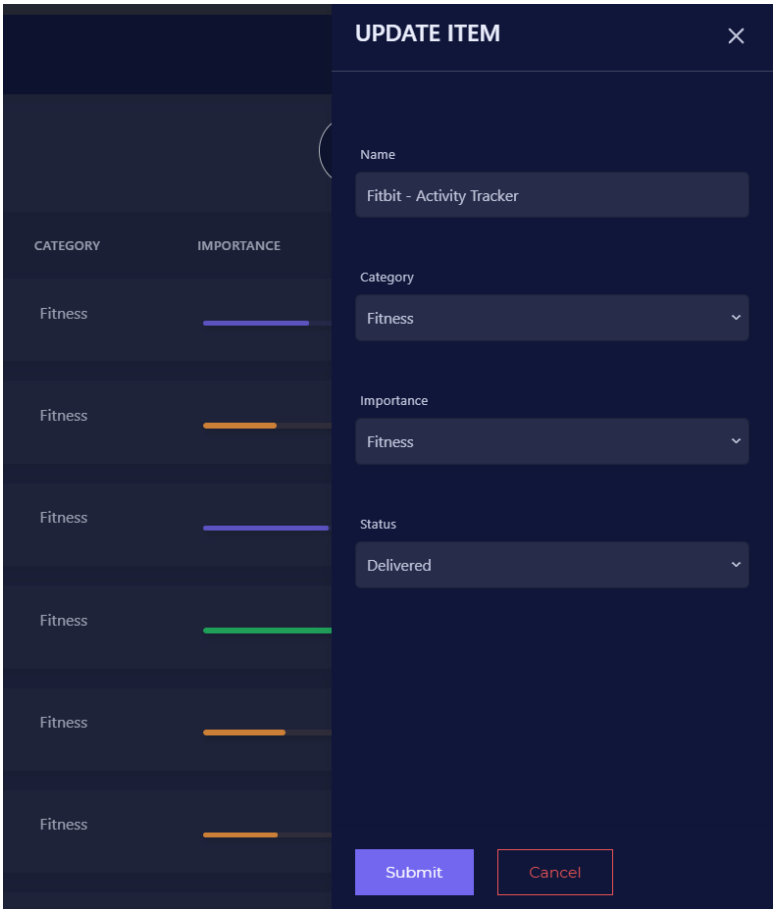

Figure 7: Component for updating or adding an activity

Figure 7 shows the component for adding or updating an Activity. Users can select a "name", "category", "importance", and "status" on this component. After the changes have been made and the submit button has been clicked, the list of activities will update and the component will disappear.

4.2.4. Create relaxed environment

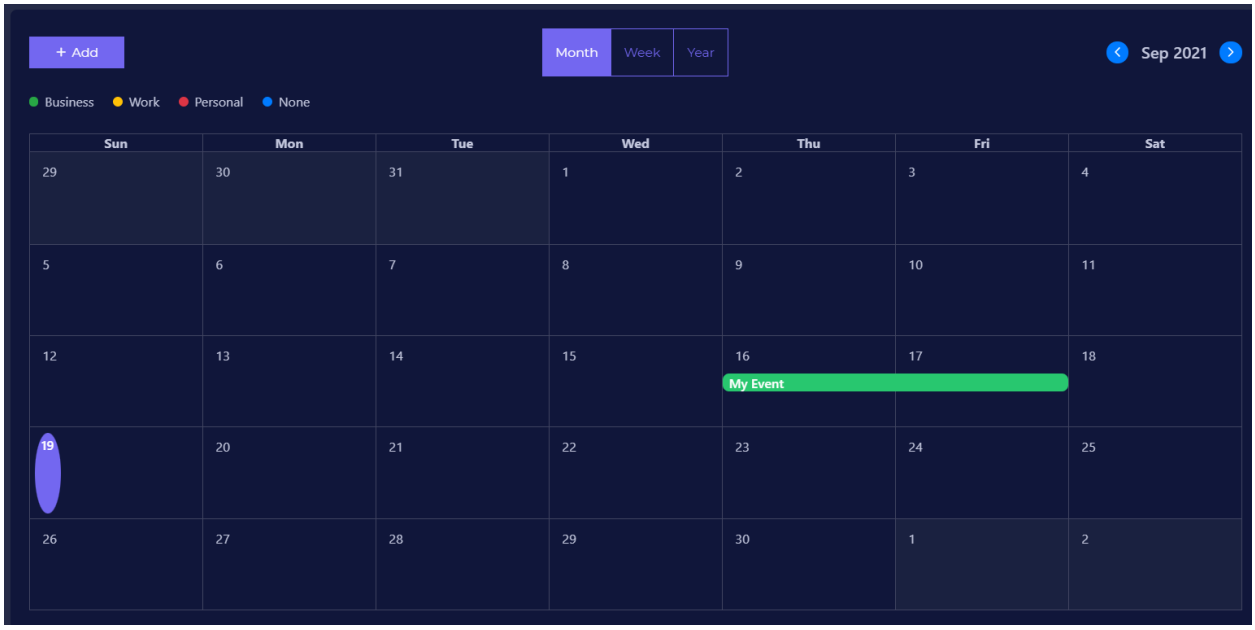

Figure 8: Calendar

Figure 8 shows the users calendar where they can add or edit events. The user can add an event by clicking on a date that will prompt a pop-up asking for the necessary information. The calendar can also be viewed in a "Month", "Week" or "Year" view. When adding an event, users can select a tag that represents either that the event is "Business", "Work", "Personal" or "None", this assists in distinguishing between events. When clicking on an event it will prompt a pop-up with the detail of that event.

According to Hill (2021) a calendar assists in giving a bigger picture on what has to be achieved. Users can plan out their sprints and add events such as meetings that they need to attend. This benefits in terms of setting out time to think and plan for the week ahead, thus creating a more relaxed environment.

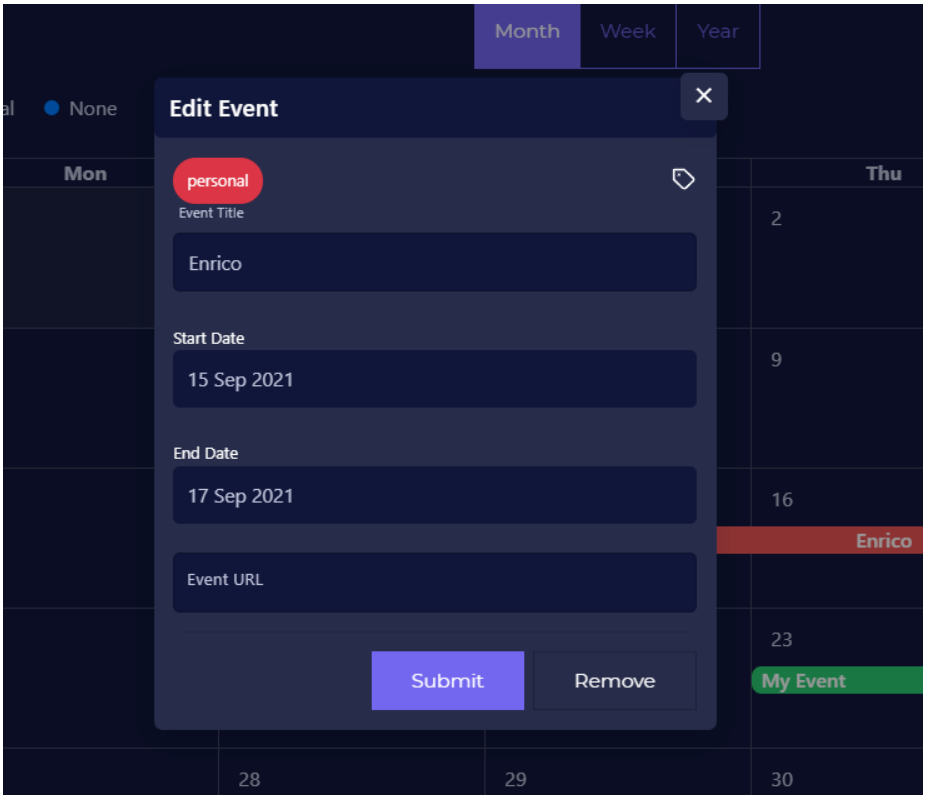

Figure 9: Calendar Edit Event

Figure 9 shows the pop-up when an event is selected. This shows the tag "Personal" as it is marked in red, along with the event "Title", "Start Date", "End Date" and "Event URL". The user can also remove an event or edit a current event by clicking "Submit".

4.2.5. User Experience comes first

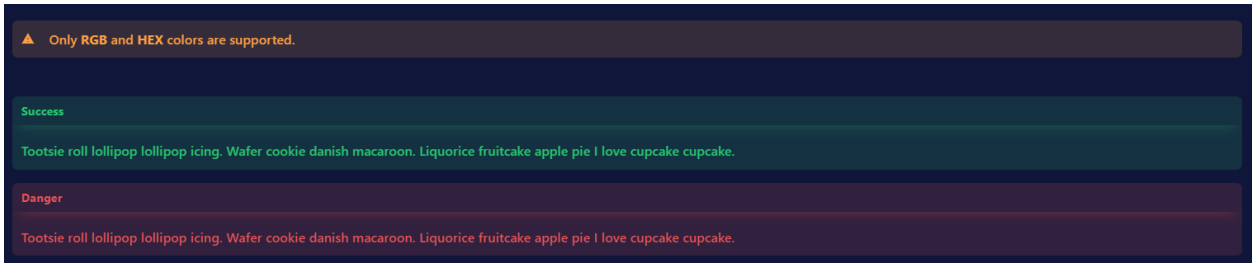

Figure 10: Guidelines for the user

Figure 10 shows dialog from the artefact, this allows for ease of use of the artefact. This requirement flows together with the human-computer interaction as user experience is important as it fulfils part of the user's needs (Gangadharan, 2019). This includes all 10 rules as discussed in Chapter 3 of this study.

The system includes notifications when an action has happened successfully or unsuccessfully. The system has validation on each input of the user, as well as loading elements if the user must wait for data to be retrieved. The user also has the ability to change information that they saved incorrectly.

5. Conclusion

The focus of this chapter was the development phase of the Vijay Vaishnavi (2004) process model and giving a visual explain on how each of the requirements or specification was implemented with the use of screenshots and explaining some of the features that was added and how to use them. Along with the requirements and specifications gathered from the interview in Chapter 4, the development of the artefact made use of the human-computer interaction rules discussed in Chapter 3.

The conclusion was that the artefact improved both communication and productivity in the company. The Artefact did not only focus on communication between employees, but also communicate important information about the project that they are working on. The artefact created a more relaxed environment in the company, while making it easier for the users to interact with the communication aspect that is required in the industry.

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